

WHAT IS CLAIMED IS:

- 1 A system for real-time buying and selling of bandwidth,
and routing of excess traffic over bandwidth purchased in real time, the
5 system comprising:
a router that routes a plurality of data packets from a number of
network users to a number of backbone providers, the router having:
a number of input ports that receive the data packets,
a number of output ports that transmit the data packets to
10 the backbone providers,
switching circuitry that connects each input port to each
output port,
traffic measuring circuitry that measures a traffic level on
each of the input ports, identifies types of data packets, and outputs
15 traffic information in response thereto,
a switch controller that receives the traffic information
from the traffic measuring circuitry and a number of routing instructions,
and controls the switching circuitry in response thereto; and
a route optimizer connected to the router, the route optimizer
20 receiving operating instructions, and generating the routing instructions
for each input port in response thereto, the routing instructions including
a first routing instruction that identifies an output port connected to a
fixed-capacity bandwidth provider that can receive data packets up to a
first traffic level, and a second routing instruction that indicates that
25 data packets in excess of the first traffic level are to be output to a
usage-based bandwidth provider that offers capacity on an as-needed
basis.

2. The system of claim 1 wherein the route optimizer identifies the usage-based bandwidth provider as a lowest cost provider from a list of providers that have capacity to a destination.
- 5 3. The system of claim 1 wherein the route optimizer identifies the usage-based bandwidth provider as a lowest cost provider that meets a predetermined maximum response time.
4. The system of claim 3 wherein the route optimizer
10 measures response times to end destinations provided by the usage-based bandwidth providers.
5. The system of claim 1 and further comprising a billing system that collects raw transaction data that indicates a bandwidth
15 provider that has received an outgoing data packet.
6. The system of claim 5 and further comprising a trading platform that outputs the operating instructions in response to user instructions.
- 20 7. The system of claim 1 wherein a right to output data packets to the fixed-capacity bandwidth provider is secured prior to the traffic level exceeding the first traffic level.
- 25 8. The system of claim 1 wherein a right to output data packets to the usage-based bandwidth provider is secured at a time that usage-based capacity is needed.

9. The system of claim 1 wherein the routing instructions further include a real-time overflow capacity routing instruction that indicates that overflow traffic from the network user is to be output to a best backbone provider at the time the overflow traffic occurs.

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10. A method for handling overflow traffic for a bandwidth user that has purchased a total fixed amount of bandwidth capacity, the bandwidth user outputting traffic to an input port, the traffic having a traffic level, the method comprising the steps of:

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monitoring the traffic level on the input port;
determining if the traffic level is near the total fixed amount of bandwidth capacity;

if near, determining if the bandwidth user wishes to reroute overflow traffic;

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if the bandwidth user wishes to reroute overflow traffic, determining if the bandwidth user has selected a provider to handle overflow traffic; and

if the bandwidth user has not selected a provider to handle overflow traffic, purchasing capacity to handle the overflow traffic when the traffic level exceeds the total fixed amount of bandwidth capacity.

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11. The method of claim 10 and further comprising the steps of:

after capacity has been purchased to handle the overflow traffic,

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outputting a sales notification; and

updating a list of sellers to indicate that capacity has been purchased in response to the sales notification.

12. The method of claim 10 and further comprising the steps of:

if the traffic level is not near the total fixed amount of bandwidth capacity, evaluating bandwidth seller instructions to determine if the bandwidth user wishes to sell any excess capacity; and
5 when the bandwidth user wishes to sell excess capacity, updating a list of sellers to indicate that capacity from the bandwidth user is available for sale.

10 13. The method of claim 11 and further comprising the steps of:

if the traffic level is not near the total fixed amount of bandwidth capacity, evaluating bandwidth seller instructions to determine if the bandwidth user wishes to sell any excess capacity; and
15 when the bandwidth user wishes to sell excess capacity, updating a list of sellers to indicate that capacity from the bandwidth user is available for sale.

20 14. A method for routing data traffic from a start point to an end destination, a plurality of bandwidth providers being connected to the start point and providing service to the end destination, the method comprising the steps of:

continually measuring an amount of time required to send data to the end destination on each of the bandwidth providers that provide
25 service to the end destination;

statistically measuring the amount of time to form a measured response time;

assigning each bandwidth provider to one of a range of response times based on the measured response time.

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identifying a next site to be pinged; and

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forming a list of sellers from the modified list of backbone providers by adding bandwidth resellers to the list when the bandwidth resellers have excess capacity on a backbone provider on the list of backbone providers, and by updating the list of sellers which have more or less capacity available due to a sale; and

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18. The method of claim 16 wherein the factor includes response times.

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